

REMARKS

Please reconsider the present application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering the present application.

I. Disposition of Claims

Claims 1-17 are pending in the present application. Claims 1-8 have been amended. Additionally, new claim 18 has been added.

II. Claim Amendments

Claims 1-7 have been amended to be directed to an “apparatus” that, according to amended independent claim 1, comprises “a unitary capacitor . . . having an aperture.” Moreover, as independent claim 1 has been amended to be directed to an “apparatus” that comprises “a unitary capacitor,” the limitation in original claim 1 referring to the capacitive material is redundant and has been removed. No new matter has been added by way of these amendments as support for these amendments may be found, for example, in Figure 4 of the present application.

Dependent claim 3 has been further amended to recite that the “unitary capacitor,” instead of the prior referred to “capacitive housing,” comprises a layer of an electrically conductive material and a layer of a dielectric material. No new matter has been added by way of this amendment as support for this amendment may be found, for example, in paragraph [0018] of the present application.

Dependent claim 4 has been further amended to recite that “a housing of the

unitary capacitor is made from a plastic material.” No new matter has been added by way of this amendment as support for this amendment may be found, for example, in paragraph [0018] of the present application.

Dependent claim 6 has been further amended to recite that “the unitary capacitor comprises co-fired ceramic.” No new matter has been added by way of this amendment as support for this amendment may be found, for example, in paragraph [0018] of the present application.

Independent claim 8 has been amended to recite that a “unitary windowframe capacitor,” among other limitations, “is arranged to substantially cover an available area of the top surface of the package substrate.” No new matter has been added by way of this amendment as support for this amendment may be found, for example, in paragraph [0018] of the present application.

III. New Claim

New claim 18 has been added. Dependent on amended independent claim 8, new claim 18 requires that the available area of the top surface of the package substrate (on which the windowframe capacitor is connected) is substantially equal to an area of the top surface of the package substrate less an area of the semiconductor die (which is mounted on the top surface of the package substrate). No new matter has been added by the addition of new claim 18 as support for new claim 18 may be found, for example, in Figure 4 of the present application and in paragraph [0018] of the Specification. Accordingly, entry and favorable treatment of new claim 18 is respectfully requested.

IV. Rejection(s) under 35 U.S.C § 102

Claims 1, 2, 5, and 7 were rejected under 35 U.S.C. § 102(a) as being anticipated by Applicant's Prior Art Figures. For the reasons set forth below, this rejection is respectfully traversed.

The present invention relates to a capacitor that is generally configured in the shape of a windowframe, and hence referred to as "windowframe capacitor." Specification, paragraph [0018]. As shown in Figure 4 of the present application, such a configuration allows the windowframe capacitor to be positioned around a semiconductor die mounted on a chip package substrate. Accordingly, amended independent claim 1 requires at least a unitary capacitor having an aperture formed in a central portion of the unitary capacitor. Advantageously, embodiments of the present invention allow the capacitor to surround a semiconductor die on a chip package substrate (see, e.g., Figure 4 of the present application). Moreover, such a capacitor design allows for an increase in effective capacitance while decreasing high inductances normally associated with a multitude of individual high frequency capacitors.

Applicant's Prior Art Figures, namely Figures 1 and 2 of the present application, in contrast to the present invention, fail to disclose a capacitor design in which a single capacitor has an aperture formed in a central portion of the capacitor. Prior art Figure 2 shows multiple capacitors 17 disposed on a package substrate 13. None of the capacitors 17 show "an aperture" as required in amended claim 1. Thus, Applicant's Prior Art Figures fail to either inherently or explicitly disclose a capacitor having an aperture. Accordingly, Applicant's Prior Art Figures fail to anticipate the claims of the present application, and withdrawal of the § 102 rejection is respectfully requested. Claims 2, 5,

and 7, which depend from amended independent claim 1, are patentable for at least the same reasons.

V. Rejection(s) under 35 U.S.C § 103

Claim 3

Claim 3 was rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Figures in view of U.S. Patent No. 6,072,211 issued to Miller et al. (hereinafter "Miller"). For the reasons set forth below, this rejection is respectfully traversed.

As shown in Figure 1 of Miller, Miller is directed to a semiconductor package 10 that uses an insulator 12 to form a shunt capacitor. Miller is completely silent with regard to a capacitor having an aperture as required by amended claim 1. Thus, Miller fails to disclose the limitations of amended claim 1 that are not disclosed by Applicant's Prior Art Figures. Accordingly, Applicant's Prior Art Figures and Miller, whether considered in combination or separately, cannot render claim 3 obvious, and withdrawal of the § 103 rejection of claim 3 is respectfully requested.

Claim 4

Claim 4 was rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Figures in view of Miller and U.S. Publication No. 2002/0011354 in the name of Barnett et al. (hereinafter "Barnett"). For the reasons set forth below, this rejection is respectfully traversed.

Barnett is directed to low temperature co-fired ceramic multichip modules that are used to provide high density interconnects between electric elements (see Barnett,

Abstract). Barnett is completely silent as to a capacitor that has an aperture so as to allow the capacitor to surround a semiconductor die on a chip package substrate. Thus, Barnett fails to disclose the limitations of amended claim 1 that are not disclosed by Applicant's Prior Art Figures or Miller. Accordingly, Applicant's Prior Art Figures, Miller, and Barnett, whether considered in any combination or separately, cannot render claim 4 obvious, and withdrawal of the § 103 rejections of claim 4 is respectfully requested.

Claim 6

Claim 6 was rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Figures in view of Barnett and U.S. Patent No. 6,215,171 issued to Pape (hereinafter "Pape"). For the reasons set forth below, this rejection is respectfully traversed.

Pape is directed to an integrated circuit module design that provides a package surrounding a passive component and a base disposed on an integrated circuit (see Pape, column 1, lines 34 – 41). Pape is completely silent as to a capacitor that has an aperture so as to allow the capacitor to surround a semiconductor die on a chip package substrate. Thus, Pape fails to disclose the limitations of amended claim 1 that are not disclosed by Applicant's Prior Art Figures or Barnett. Accordingly, Applicant's Prior Art Figures, Barnett, and Pape, whether considered in any combination or separately, cannot render claim 6 obvious, and withdrawal of the § 103 rejection of claim 6 is respectfully requested.

Claims 8 and 11-13

Claims 8 and 11-13 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 4,839,712 issued to Mamodaly et al. (hereinafter "Mamodaly"). For the reasons set forth below, this rejection is respectfully traversed.

Amended independent claim 8 requires in part that a unitary windowframe capacitor be arranged to substantially cover an available area of the top surface of a package substrate on which the capacitor may be connected. Mamodaly, in contrast to the present invention, is directed to a compact combiner arrangement. As shown in Figures 6 and 7 of Mamodaly, a capacitor (5 in Figure 6 and 17 in Figure 7) does not substantially cover an available area of the top surface of a substrate 11. For example, in Figure 7 of Mamodaly, a considerable amount of the top surface of substrate 11 remains exposed. This is important because as disclosed in the present application, the capacitor arrangement disclosed in the present application (see, e.g., Figure 4 of the present application) allows for an increase in effective capacitance while decreasing high inductances normally associated with a multitude of individual high frequency capacitors.

Thus, Mamodaly fails to disclose each and every limitation of amended independent claim 8 and cannot render amended claim 8 obvious. Dependent claims 11-13 are patentable for at least the same reasons. Accordingly, withdrawal of the § 103 rejections of claims 8 and 11-13 is respectfully requested.

Claims 9 and 17

Dependent claims 9 and 17, which depend from amended claim 8, were rejected under 35 U.S.C. § 103(a) as being obvious over Mamodaly in view of U.S. Publication No. 2002/0011662 in the name of Komiya et al. (hereinafter "Komiya"). For the reasons

set forth below, this rejection is respectfully traversed.

Komiya is directed to a design that provides a low-impedance connection between a high-speed circuit and a capacitor in the power supply path (see Komiya, Abstract). As shown in Figures 1, 2, 4, 5, and 8 of Komiya, bypass capacitors 102 are mounted on a substrate 103. However, none of these figures or any discussion in Komiya discloses, or otherwise teaches, a unitary capacitor, having an aperture formed therein, that is arranged to substantially cover an available area of the top surface of a package substrate on which the capacitor may be connected as required by amended claim 8.

Thus, Komiya fails to disclose the limitations of amended independent claim 8 that are not disclosed by Mamodaly. Accordingly, Mamodaly and Komiya, whether considered in combination or separately, cannot render dependent claims 9 and 17 obvious, and withdrawal of the § 103 rejections of claims 9 and 17 is respectfully requested.

Claim 10

Dependent claim 10, which depends from amended claim 8, was rejected under 35 U.S.C. § 103(a) as being obvious over Mamodaly in view of Komiya and U.S. Patent No. 4,827,323 issued to Tigelaar et al. (hereinafter "Tigelaar"). For the reasons set forth below, this rejection is respectfully traversed.

Tigelaar is directed to stacked capacitor designs that provide increased capacitance. However, Tigelaar is completely silent as to a unitary capacitor, having an aperture formed therein, that is arranged to substantially cover an available area of a top surface of a package substrate to which the capacitor may be connected as required by

amended claim 8.

Thus, Tigelaar fails to disclose the limitations of amended independent claim 8 that are not disclosed by Mamodaly. Accordingly, Mamodaly, Komiya, and Tigelaar, whether considered in any combination or separately, cannot render dependent claim 10 obvious, and withdrawal of the § 103 rejection of claim 10 is respectfully requested.

Claim 14

Dependent claim 14, which depends from amended claim 8, was rejected under 35 U.S.C. § 103(a) as being obvious over Mamodaly in view of Miller. For the reasons set forth below, this rejection is respectfully traversed.

As discussed above, Miller is directed to a semiconductor package that uses an insulator to form a shunt capacitor. Miller is completely silent as to a unitary capacitor, having an aperture formed therein, that is arranged to substantially cover an available area of a top surface of a package substrate to which the capacitor may be connected as required by amended claim 8.

Thus, Miller fails to disclose the limitations of amended independent claim 8 that are not disclosed by Mamodaly. Accordingly, Mamodaly and Miller, whether considered in combination or separately, cannot render dependent claim 14 obvious, and withdrawal of the § 103 rejection of claim 14 is respectfully requested.

Claim 15

Dependent claim 15, which depends from amended claim 8, was rejected under 35 U.S.C. § 103(a) as being obvious over Mamodaly in view of Miller and Barnett. For

the reasons set forth below, this rejection is respectfully traversed.

As discussed above, Barnett is directed to low temperature co-fired ceramic multichip modules that are used to provide high density interconnects between electric elements. Barnett is completely silent as to a unitary capacitor, having an aperture formed therein, that is arranged to substantially cover an available area of a top surface of a package substrate to which the capacitor may be connected as required by amended claim 8.

Thus, Barnett fails to disclose the limitations of amended independent claim 8 that are not disclosed by Mamodaly or Miller. Accordingly, Mamodaly, Barnett, and Miller, whether considered in any combination or separately, cannot render dependent claim 15 obvious, and withdrawal of the § 103 rejection of claim 15 is respectfully requested.

Claim 16

Dependent claim 16, which depends from amended claim 8, was rejected under 35 U.S.C. § 103(a) as being obvious over Mamodaly in view of Miller, Barnett, and Pape. For the reasons set forth below, this rejection is respectfully traversed.

As discussed above, Pape is directed to an integrated circuit module design that provides a package surrounding a passive component and a base disposed on an integrated circuit. Pape is completely silent as to a unitary capacitor, having an aperture formed therein, that is arranged to substantially cover an available area of a top surface of a package substrate to which the capacitor may be connected as required by amended claim 8.

Thus, Pape fails to disclose the limitations of amended independent claim 8 that

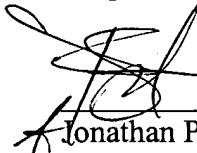
are not disclosed by Mamodaly, Miller, or Barnett. Accordingly, Mamodaly, Pape, Barnett, and Miller, whether considered in any combination or separately, cannot render dependent claim 16 obvious, and withdrawal of the § 103 rejection of claim 16 is respectfully requested.

VI. Conclusion

Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226.092001;P5787).

Date: 5/19/03

Respectfully submitted,

 #45,079
Jonathan P. Osha, Reg. No. 33,986
ROSENTHAL & OSHA L.L.P.
1221 McKinney Street, Suite 2800
Houston, TX 77010

Telephone: (713) 228-8600

Facsimile: (713) 228-8778